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PENSOFT

A new southernmost record of *Elaenia chiriquensis* Lawrence, 1865 (Passeriformes, Tyrannidae) in Brazil

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Abstract
Species of the genus *Elaenia* are difficult to distinguish from one another using only morphological characteristics. In Brazil, *Elaenia chiriquensis* occurs from northern Paraná to Roraima and is absent in Santa Catarina and Rio Grande do Sul states. Using audio and photographic evidence, as well as the comparison of sonograms, we confirm the occurrence of this species 700 km southwest of its previously known distribution. Our new record is from Palmas, Paraná, only 600 m from the border with Água Doce, Santa Catarina, which suggests the possibility that this species also occurs in this state. Deforestation for monocultures and pastures might have contributed to this species' expansion in the Atlantic Rainforest biome.

Keywords
Palmas; Paraná; highland fields; range extension; Lesser Elaenia; ecology.

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Introduction

The elaenians, genus *Elaenia* Sundevall, 1836, are a group of passeriform birds belonging to the family Tyrannidae, which have a medium-sized body and faded colors (Fig. 1). Species are very similar and are more easily and correctly identified by their vocalization (Ridgely et al. 2016). These species present geographical variations and the same species may present different dialects in different regions (Krebs and Kroodsma 1980). The Lesser Elaenia, *E.chiriquensis* Lawrence1865, inhabits shrub fields, where it feeds on small insects and small fruits (Gimenes et al. 2007). It is the smallest elaeninan, and its vocalization is a determinant factor for correct identification (Gwynne et al. 2010).

Elaenia chiriquensis usually occurs at elevations below 1100 m (Ridgely et al. 2016), and its distribution extends from Costa Rica and Panama to northeastern Argentina; in Brazil it is not known to be resident in southern Amazonia and is not known to occur in Santa Catarina and Rio Grande do Sul (Schauensee 1982, Marini and Cavalcanti 1990, Sick 1997). This species migrates to the Central Region of Brazil; there it reproduces in the Cerrado from September to December and has 2 reproductive peaks, 1 in October and 1 in November (Medeiros and Marini 2007). It does not occur in forests of the Atlantic Rainforest, but it can be found in highland field areas in northernmost Paraná (Sigrist 2014). The conservation status of *E. chiriquensis* is Least Concern (IUCN 2017).

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Figure 1. Individual of *Elaenia chiriquensis* (Lawrence, 1865) recorded in the municipality of Palmas, Paraná, Brazil. Photograph by J.V.P. Andriola.

Methods

The audio recordings were made with a Canon Eos Rebel T5i digital SLR camera, and the recorded sound was edited in Avisoft-SASLab (v. 5.2.09) software for sound cutout, amplification, and noise suppression. The audio recording was deposited at the Xeno-Canto Foundation under the number XC355792 (http://www.xeno-canto.org/355792). Literature sources (Schauensee 1982, Marini and Cavalcanti 1990, Sick 1997) and citizen-science websites (WikiAves 2017, Xeno-Canto Foundation 2017, eBird 2017, Táxeus 2017, Macaulay Library 2017) were consulted on the occurrence of *E. chiriquensis*in Brazil. We identified this species by comparing sonograms of its song (Xeno-Canto Foundation 2017, Macaulay Library 2017). We mapped this species using QGIS (v. [2.18.6]), highlighting the historical records for the state of Paraná, our new record from the city of Palmas, and the possible occurrence in the city of Água Doce, Santa Catarina.

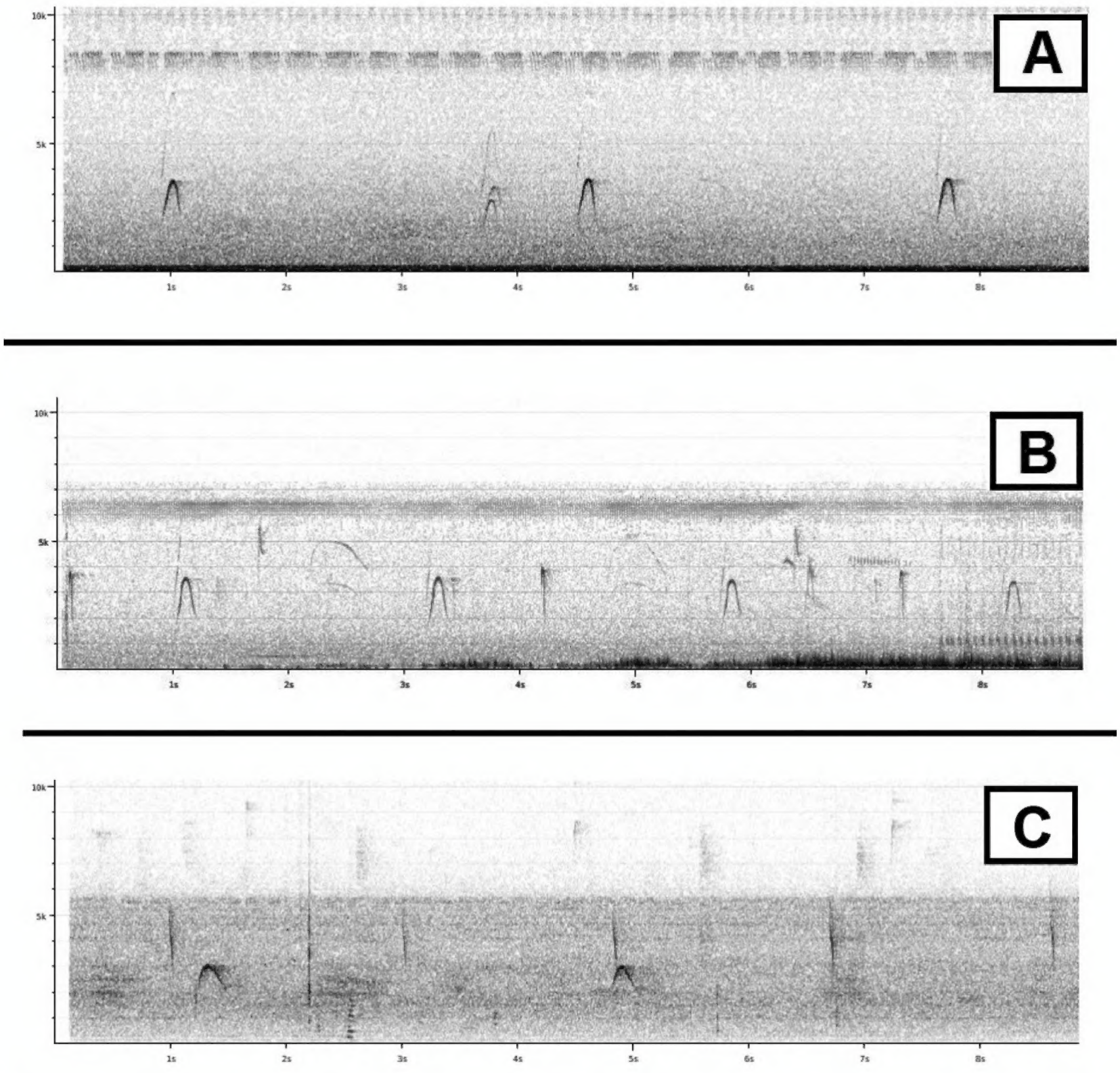

Figure 2. Comparison of (**A**) a sonogram of the species *Elaenia chiriquensis* (sonogram by Godoy 2010) with (**B**) the sonogram of one of the individuals recorded in Palmas, PR, and with (**C**) a sonogram of *Elaenia chilensis* (sonogram by Meyer 2014). Source: ©Xeno-Canto Foundation 2017.

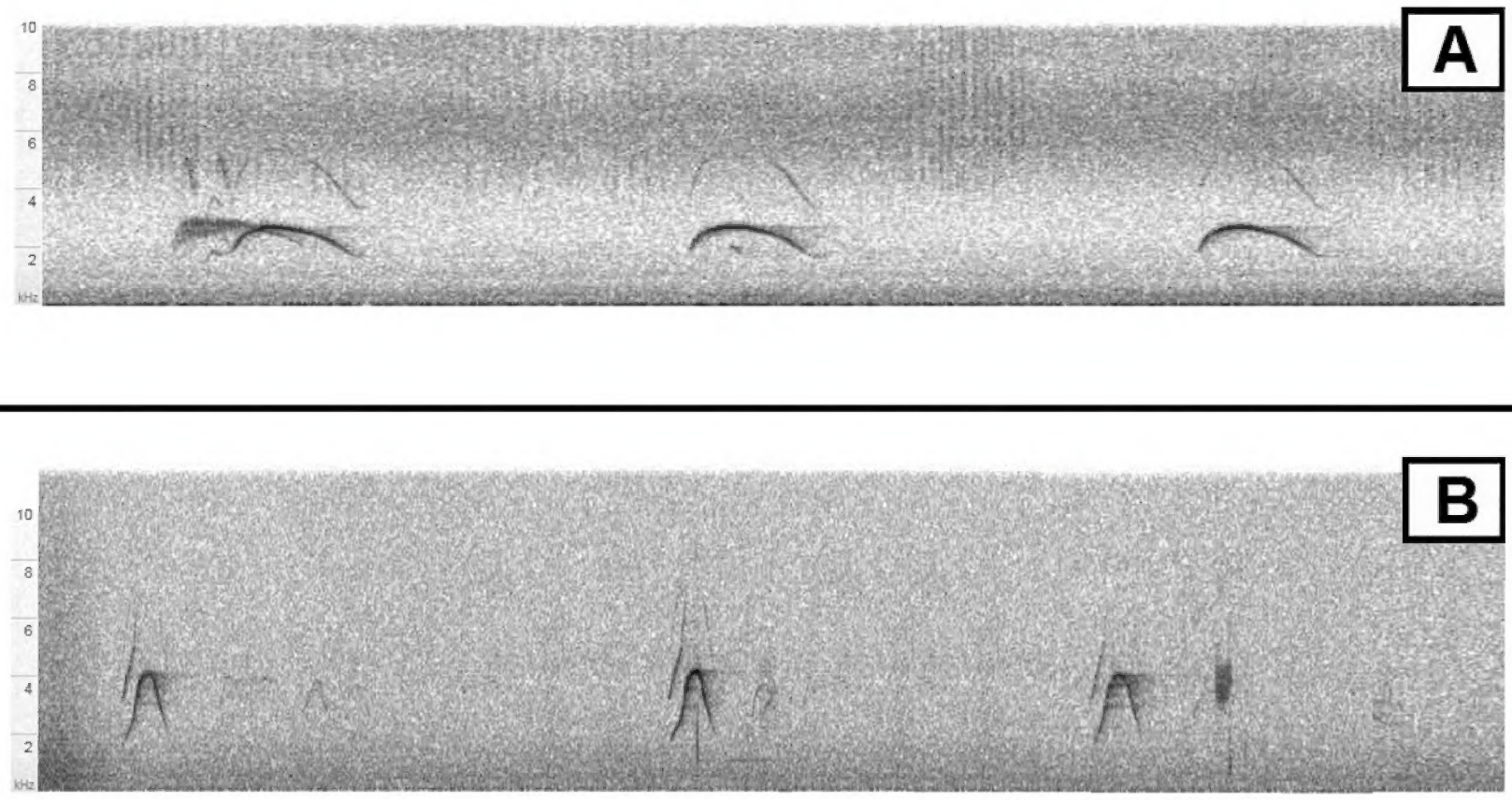

Figure 3. Comparison of (**A**) a sonogram of the species *Elaenia chilensis* (sonogram by Areta 2011) with (**B**) a sonogram of the species *Elaenia chiriquensis* (sonogram by Remold 1998). Source: ©Macaulay Library 2017.

Results

New record. Brazil: Parana: city of Palmas (26°34′47″ S, 051°46′28″ W, 1239 m elev.), observer João Vitor Andriola, 26 January 2017, ca 11:00 h, 3 adult individuals recorded in a highland field remnant. The 3 individuals constantly vocalized from the tops of shrubs, sometimes alternating their perches.

Identification. Because there are almost no obvious morphological differences among species of *Elaenia*, the individuals were identified only by comparison of the sonograms of their song, although we also photographed these individuals (Fig. 1). All southern and central-western sonograms of *E. chiriquensis* deposited in the Xeno-Canto Foundation and in the Macaulay Library were compared with our recordings to avoid differences in dialects. The song of *E. chiriquensis* is characterized as a treble sound on a 0.2ms loop, emitting approximately 1 chirp per 2 sec, with a frequency of around 5kHz. The Chilean Elaenia, *Elaenia chilensis* Hellmayr, 1927, also occurs in Paraná and has a very similar vocalization. However, the sonogram of *E. chilensis* differs by lasting slightly longer, approximately 0.4 ms and having a lower tone than the sonogram of *E. chiriquensis*, with frequency of approximately 4 kHz (Figs 2, 3). Other elaenians that occur in South Brazil do not have similar vocalizations.

Discussion

As other species of *Elaenia*, *E. chiriquensis* is difficult to identify by only looking at its morphology. Because this species is not large, not colorful, and requires study of its vocalization, it almost never holds the observer's attention. Thus, this species is possibly under- or unrecorded from other regions because of the lack of attention by observers. Until now, the southernmost known record of this species in Brazil is at Morretes, Paraná (25°35′17″ S, 048°55′10″W) (Breves 2016). Outside of Brazil, there is a record from Itapúa, Paraguay, 23 km south of Palmas (eBird 2004); however, it lacks photographs or audio and its veracity cannot be proved. Our record from Palmas expands the Brazilian distribution of this species by approximately 300 km southwest and 100 km south (Fig. 4) from the nearest known records and fills a distribution gap of more than 700 km if Paraguay record is accepted. *Elaenia chiriquensis* is absent from the state of Santa Catarina (Sick 1997), but our record was less than 600 m from the border with the city of Água Doce, Santa Catarina, which suggest that this species is likely to occur at least in the northern part of this state.

The city of Palmas is within the Atlantic Rainforest biome, and the area where we observed *E. chiriquensis* is predominantly shrub vegetation, composed mostly of *Baccharis* spp. (Asteraceae) with small fragments of Araucaria Moist Forest. The land is mainly used for crop and *Pinus* spp. monocultures and fruit orchards, but other impacts on the environment are road construction and the constant movement of people.

Elaenia chiriquensis inhabits fields with shrubs in the Cerrado biome (Gimenes et al. 2007), but our record of this species in Paraná lies within the Atlantic Moist Forest biome. As in the rest of the South Region of Brazil, most of the Atlantic Forest habitat has been replaced by agriculture and pasture for livestock, transforming a once forested landscape into monoculture fields (MMA 2007). These alterations could have contributed to this species expanding into new areas where it did not occur before, as new territory became suitable.

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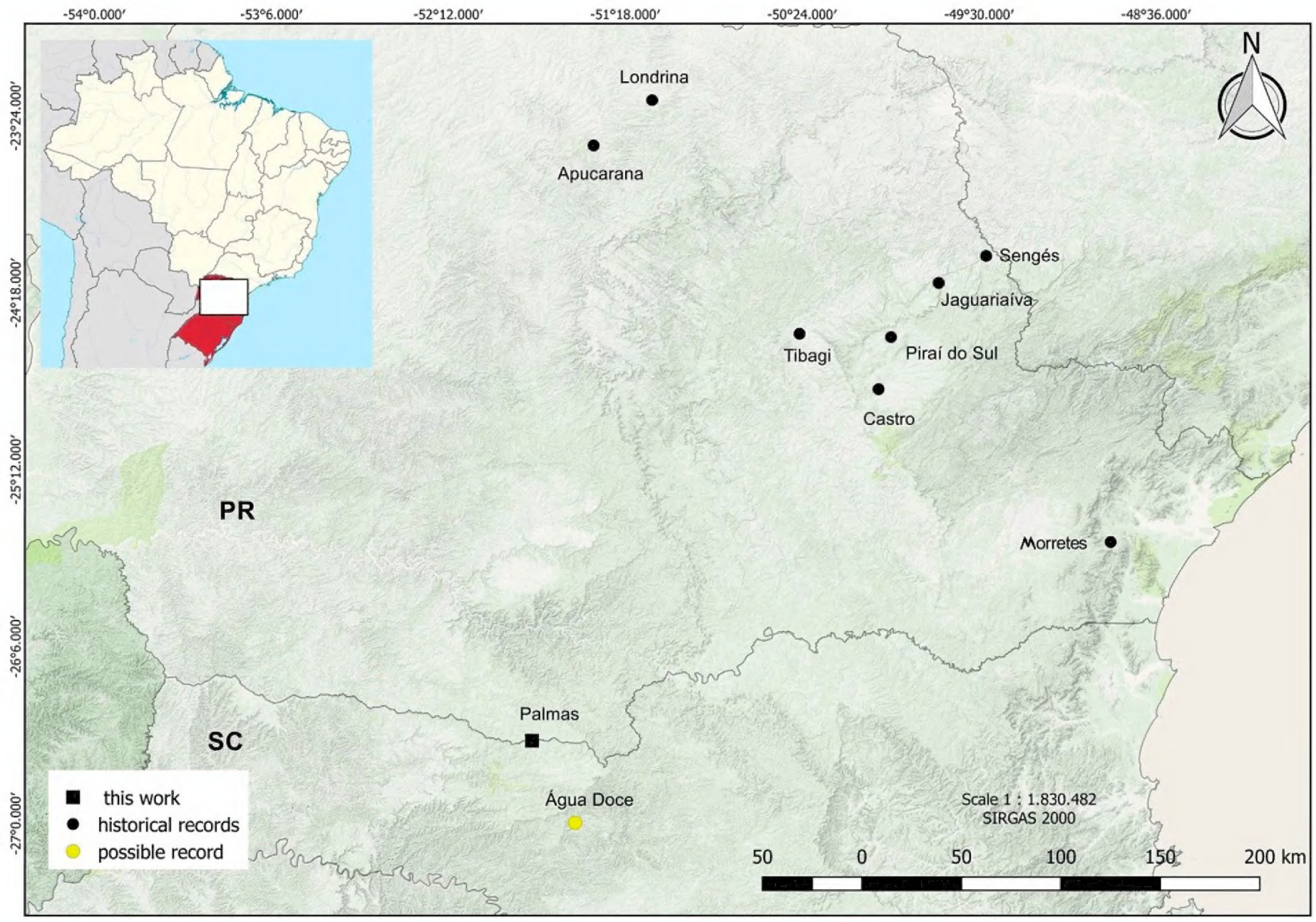

Figure 4. Species distribution map in Paraná, containing the new record in the municipality of Palmas and the possible occurrence for the city of Água Doce, SC. Red region marked on top-left smaller map represents the South Region of Brazil (Rio Grande do Sul, Santa Catarina and Paraná States). Map produced by J.C. Kilpp.

Authors' Contributions

JVA collected the data; JVA and APM wrote the text.

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